Future Directions of Inquiry in Adapted Physical Activity

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It is appropriate for professionals to look forward periodically to envision a future that serves its constituents most effectively. No doubt, the turn of the century is a timely moment to engage in such reflection and prediction. The purpose of this paper is to sketch some future trends of inquiry in adapted physical activity. These include investigation into ethics in adapted physical activity. Empirically based issues of inquiry include physical activity as a dependent measure, diverse and changing populations, theoretical and applied research, nomothetic and idiographic research perspectives, clusters and comorbidity, self-determination, and inclusion/integration.

Predicting the future is a daunting task, when events will surely occur that are virtually unimaginable (Rescher, 1998). While the novelist Jules Verne was a somewhat successful futurist, a former chairperson of IBM in 1943 believed that the world market for computers was about 5, and Bill Gates remarked in 1990 that 640 K ought to be enough memory for anybody (Haggerty, 1997). Yet, it is appropriate and necessary for professionals to look beyond current philosophies, theories, and practices in a continuing search for more effective means to serve their immediate constituents as well as society. The dawn of a new decade and century is an appropriate time for such reflection.

The purpose of the present paper is to adumbrate a number of inquiry issues in adapted physical activity that will have considerable impact in the present decade. Some have already begun to influence the field. The term inquiry is used, rather than research, to suggest a more inclusive viewpoint. Inquiry includes philosophical debate as well as determining program effectiveness, which some might not consider to be pure research (see Smith & Glass, 1987). Rather than outline specific questions of import, I attempt to discuss issues that transcend many questions in adapted physical activity. These include philosophical debate, physical activity as a dependent measure, diverse and changing populations, theoretical

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and applied research, nomothetic and idiographic research perspectives, clusters and comorbidity, self-determination, and inclusion/integration.

**Philosophical Debate**

There are few scholarly philosophical papers in adapted physical activity and even fewer adapted physical activity specialists educated in philosophical inquiry. This is troublesome since adapted physical activity is often based on ideology, rather than exclusive empiricism. Philosophy can assist in dealing with some of these powerful ideas. For example, we often claim that adapted programs enhance the physical well-being of individuals with a disability. Yet, we also argue that they should be afforded more choice, decision making, and personal empowerment (e.g. Reid & Hermo, 1998; Wehmeyer, 1998; Dattiolo & Rusch, 1985). But there has been no serious discussion of how to react if the decision of the individual is to remain physically inactive (cf. Bannerman, Sheldon, Sherman, & Harchik, 1990). Moreover, professionals in adapted physical activity should have a thoughtful philosophical stance regarding significant issues such as inclusion (see DePauw & Doll-Tepper, 2000). Philosophical inquiry, particularly ethics, would assist in both formulating the questions and seeking tentative answers.

Ethics is the branch of philosophy that deals with morality: what is good, bad, right, and wrong (Bond, 1996; Thiroux, 1998). It studies the nature of morality and how to determine if an act is moral or not. In an applied analysis, it may lead to codes of ethical behavior for professionals. Since morality is about how people relate to each other to promote mutual welfare and growth (Thiroux, 1998), it is ideally suited to investigate adapted physical activity’s customs and traditions. When is it good, bad, right, or wrong to use behavior-altering medication under the guise of enhanced attention and learning? When is it bad or wrong to promote normalization, if in practice that essentially means “make more like everyone else,” thus ignoring individual differences and diversity? A careful study of ethics will assist adapted physical activity to critically evaluate accepted rules and practices. A value system, thereby created, in conjunction with databased experience and experiment, will guide intervention.

**Physical Activity as a Dependent Measure**

A critical outcome of adapted physical activity instruction should be engagement in voluntary physical activity. One of the most significant research findings from kinesiology in this century is the link between moderate to vigorous physical activity and a decrease in incidence of health conditions such as coronary heart disease (U.S. Department of Health and Human Service, 1996). It appears that physical activity is a more important dependent variable than physical fitness, since health related benefits may accrue with increases in physical activity but without concomitant physical fitness improvement (Bouchard, 1997). Therefore, a high premium will be placed on strategies that increase physical activity participation. Also, active living philosophies stress the social and affective dimensions of physical activity. Thus, topics such as enjoyment and meaning associated with physical activity will be studied with increasing frequency as a means to promote voluntary physical activity.
Therefore, more attention in adapted physical activity will be devoted to assessment and promotion of functional physical activity in ecologically valid settings. Three recent publications are examples. Watkinson and colleagues have designed an extensive observation system to assess physical activity during school recess and to identify children with movement difficulties (Watkinson et al., in press). Leiberman, Dunn, van der Mars, and McCubbin (2000) used physical activity, rather than skill or fitness, as the dependent variable in their investigation of the impact of peer tutors on deaf students in inclusive physical education. Finally, measures of physical activity supported an inclusive recess setting for children with intellectual disabilities (Lorenzi, Horvat, & Pellegrini, 2000).

Physical activity will become a common dependent variable, rather than an independent variable through which physical fitness and skill are fostered. No gold standard for assessment of physical activity has emerged, despite a rich history of physical activity assessment in special education and medical circles (Teicher, 1995; Tryon, 1991). Heart rate monitoring, questionnaires, several varieties of motion detectors, and direct observation have been studied in nondisabled populations, but each method has limitations. New and affordable technology (e.g., computer based accelerometers) will allow researchers and teachers to evaluate the effectiveness of their programs, in part, by the degree to which physical activity is enhanced. Of course, important validity studies of these measures must occur to determine the ease of inferences to participants who have disabilities (cf. Nichols, Morgan, Chabot, Sallis, Clafas, 2000; Welk & Corbin, 1995). Assessment of physical activity as a dependent variable will also enhance theoretical developments that suggest physical activity is related to, or mediated by, psychological factors such as intrinsic motivation, self-efficacy, and perceived physical competence.

Diverse and Changing Populations

Adapted physical activity has become, and will continue to become, more proactive in providing programs for diverse and changing populations (DePauw & Sherrill, 1994). Medical advances in the 20th century have almost eliminated infectious diseases such as tuberculosis and poliomyelitis or reduced the impact of metabolic disorders such as phenylketonuria. Yet, other infections such as HIV/AIDS and conditions such as fetal alcohol syndrome have emerged. The landscape of disease and impairment gradually changed throughout the 20th century, with physical activity specialists exploring the role of movement in the overall management of new problems (e.g., Courneya & Friedenreich, 1999; Parks & Danoff, 1999; Reinders-Messeling et al., 1999). This trend is likely to continue in the decades ahead, with the obvious hope that diseases are eliminated at a quicker rate than new ones emerge.

Medical advances also prolonged life during the 20th century. For example, according to a study by Baird and Sadovnick, the median life expectancy in Down syndrome is more than 55 years today (as cited in Anneren & Pueschel, 1996), whereas they usually died in childhood in the early 20th century. Also, the mortality rate related to spinal cord injuries was dramatically reduced with the discovery of antibiotics. While there is an increasingly clear picture being painted of typical aging (Spirduso, 1995), there is little clarity on how aging interacts with disability. Prema-
ture aging is typical in Down syndrome, creating numerous challenges for social policy and physical activity, but there is little known about aging and other disabilities.

Graham and Reid (2000) conducted a 13-year follow up study of the physical fitness of adults with an intellectual disability. Participants were 32 adults who had been subjects in a physical fitness study in 1983 (Reid, Montgomery, & Seidl, 1985). Not surprisingly, physical fitness levels declined over the 13 years and were low compared to those without a disability. More importantly, the calculation of effect sizes allowed comparison of the magnitude of change of the participants with the change in the general population. For individuals with an intellectual disability, the magnitude of change over the years was greater for males and females on body mass index and percent body fat and for females for cardiovascular endurance and sit-ups. It appears that adults with an intellectual disability may be particularly at risk for declining health associated with aging and low physical fitness (Pitetti & Campbell, 1991).

Aging in nondisabled populations is associated with chronic conditions such as obesity, osteoarthritis, diabetes mellitus, stroke, and coronary heart disease. The incidence of disability increases with age when disability is broadly defined as "any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human being" (Ostir et al., 1999). Physical activity has a positive impact on the prevention and management of these difficulties associated with aging (Carlson et al., 1999; Ostir et al., 1999). Adapted physical activity has dealt with several of these conditions in children or younger adults (Sherrill, 1998), and its knowledge base may prove beneficial to older adults. Thus, adapted physical activity and gerontology are likely to forge an important alliance.

Finally, the expansion of adapted physical activity to diverse populations will include both low-incidence and severe disabilities (DePauw & Sherrill, 1994). New teaching techniques, such as those that prompt correct responses (e.g. Zhang, Gast, Horvat, & Dattilo, 1995), and technological advances will enable adapted physical activity specialists to provide services to these individuals.

Theoretical and Applied Research

Adapted physical activity will always benefit from theoretical investigations from scientists who are attracted to specific questions related to disability. The atypical cerebral specialization research in Down syndrome by Elliott, Weeks, and colleagues (Elliott & Weeks, 1993; Heath, Elliott, Weeks, & Chua, 2000) is a case in point. These scholars posit that movement execution and speech perception centers are located in different cerebral hemispheres in Down syndrome, unlike the typical case where both are located in the left hemisphere. This dissociation should make it difficult for these individuals to receive verbal instruction necessary to control volitional movement. Although these researchers are not identified primarily with adapted physical activity, the field will benefit as more theoretically based research emerges from the laboratories of movement scientists who become attracted to disability-related questions, but for whom adapted physical activity is not a primary focus.

However, since adapted physical activity is a fundamentally applied field of study within kinesiology, it is not surprising that its researchers are intrigued with questions in real-life settings with functional skills. Quality applied research will become the hallmark of adapted physical activity. Reid (1989) suggested that
adapted physical activity would benefit from more theoretically-driven, but applied research, the results of which might contribute to the development of the theory in question but also to practice in adapted physical activity. The research of Ulrich and Ulrich (1999) on independent walking in Down syndrome is an excellent example of theoretically rich but applied research in adapted physical activity and motor development. Infants with Down syndrome are notoriously late in achieving independent walking. Research from dynamic systems theory would suggest that leg strength is a significant rate limiter to independent walking. Therefore, Ulrich and Ulrich examined the impact of supported treadmill walking, conducted essentially by parents on a daily basis, on leg strength and onset of independent walking. Overall, their findings supported the efficacy of treadmill walking in promoting earlier onset of walking.

Finally, a number of challenges to the research enterprise in adapted physical activity has been articulated recently, including clear subject description and sampling design, reporting effect sizes, using aggregate data with caution, attention to program effectiveness questions, and incorporating a theoretical richness (e.g., Bouffard, 1993; Broadhead, 2000; Doll-Tepper & DePauw, 1996; Lavay & Lasko-McCarrthy, 1992; Reid, 1992, 1993; Sherrill, 1997; Sherrill & O'Connor, 1999; Sutlive & Ulrich, 1998). A landmark conference of the North American Federation of Adapted Physical Activity, held in Banff, Alberta in September 1996 produced an excellent volume of the *Adapted Physical Activity Quarterly* (July, 1998) entitled "Questioning our Research Assumptions." Adapted physical activity researchers have begun to address the assumptions of theories and, therefore, the very nature of data collection and interpretation. Some of the suggestions to emerge from the Banff conference have been debated at recent symposia (e.g., Shephard, 1999). Regardless of one's individual position in such debate, it reflects a maturing field that will produce outstanding research in the future.

**Nomothetic and Idiographic Research Perspectives**

An active debate in adapted physical activity inquiry deals with the relationship between nomothetic and idiographic research. Nomothetic research is the search for universal principles or laws that can be generalized across people and that lead to prediction (Bouffard, 1997). It seeks regularities across people. Most assume that research with large numbers of subjects allows such generalization and prediction, particularly when bolstered with appropriate statistical analysis. These traditional methods have guided much of science in the 20th century (Danziger, 1990; Slife & Williams, 1995).

Idiographic research seeks regularities at the individual level; therefore, it is dependent upon multiple samples of "data" from the same person (Bouffard, 1997). Case-study methodology and time-series designs are often associated with idiographic research. Bouffard (1997) has argued that true nomothetic knowledge must start with idiographic analysis. In other words, build the universal laws by searching for them at the individual level. This is different than building the nomothetic laws by aggregating data from individuals. Thus, nomothetic knowledge will not evolve from studying large numbers of subjects and searching for central tendencies, because aggregation of data obscures rather than illuminates (Bouffard, 1993). These discussions mirror the challenge of traditional methods of science by some scholars in sport psychology (e.g., Martens, 1987).
These notions have particular relevance to adapted physical activity due to low numbers of available subjects and inherent wide variability; in fact, the people of interest may be considered “outliers” in traditional statistical analyses. Therefore, single subject designs, case studies, microgenetic analyses, and qualitative methods have been proposed as means of generating idiographic laws (e.g., Bouffard, 1997). Research designs of this sort are likely to become more common in adapted physical activity. Of course, with repeated idiographic studies, nomothetic laws may begin to emerge. Some have also suggested that combining methodologies from both idiographic and nomothetic traditions might be effective (Dunn, 1994).

The viewpoints of Bouffard (1993, 1997) and similarly minded scholars (Slife & Williams, 1995; Wheeler, 1998) have not gone unchallenged. Shephard (1999) has championed traditional nomothetic approaches, arguing that they have produced irrefutable progress in the 20th century in the biological sciences. This debate will continue and compel adapted physical activity specialists to reconsider their cherished researched methodologies. In the end, the community of scholars will be the better for this exposure and the research enterprise improved.

Clusters and Comorbidity

Large inter- and intra-individual performance differences have long been recognized in people with disabilities. However, cluster analyses have demonstrated that the heterogeneity may include subsamples or clusters of individuals who share some performance similarities. Rarick, Dobbins, and Broadhead (1976) first identified clusters of individuals with a disability in motor behavior. More recently, four subtypes were identified in a cluster analysis of children with the developmental coordination disorder (Wright & Sugden, 1996). The first group demonstrated an even profile across five areas: moving in a changing environment, fast hands, catching, dynamic balance, and control of self. Group two had particular difficulties in catching, while group three did poorly on tasks with a changing environment. Finally, group four exhibited particular difficulty with dynamic balance and manipulating the hands quickly but was above average in catching. While the notion of heterogeneity has long been associated with disability, the idea of performance subsamples is rather new.

In practical terms, two children with coordination difficulties might be associated with two different clusters and, therefore, have very different programming needs. Contemporary adapted physical activity develops programs on the basis of individual needs and choice and, therefore, has no difficulty with the notion of clusters. Clusters do present some challenge to researchers. First, there is a need to replicate these studies to validate definitive clusters. Second, while waiting for the outcome of this research, investigators might wish to rethink their questions in light of potential clusters. For example, in a recent study of ball flight prediction in students with a developmental coordination disorder (Lefebvre & Reid, 1998), the sample was intentionally designed to include children whose coordination difficulties involved ball skills. It seemed a necessary restriction in a study about ball catching and coordination problems. If consistently demonstrated clusters emerge, researchers may have to change their notions of disability and adopt the cluster of people as the unit of study rather than a disability.

Comorbidity, the occurrence of two or more disabilities in a single person, has been increasingly recognized in people with a disability. It has been referred to
previously as dual diagnosis or multiple disability, but the incidence figures were often low. Recently, however, comorbidity has been identified with considerable frequency in children with developmental disabilities. For example, Kaplan, Wilson, Dewey, and Crawford (1998) explored comorbidity among children with attention deficit hyperactive disorder (a comorbid condition itself), reading disabilities, and developmental coordination disorder. Identified were 115 children with at least one of these problems. Of these, only 53 obtained scores suggesting they were "pure" cases. In fact, 39 children met criteria for two problems and 23 were identified with three problems. This led Kaplan et al. to wonder if comorbidity was the rule rather than the exception within developmental disabilities.

Comorbidity raises intriguing etiology questions. Also, Kaplan et al. (1998) challenge the existence of distinct childhood disabilities based on attention, reading, and movement. It is certainly a myth that a specific disability is a unitary phenomenon. Both comorbidity and clusters underscore the difficulty of researchers in securing homogenous samples. Certainly, detailed description and careful selection of samples is recommended. Also, additional support for idiographic studies seems implicated.

**Self-Determination**

Self-determination will be a major force in adapted physical activity (DePauw & Sherrill, 1994; Reid & Hermo, 1998). Parents and professionals have often emphasized skill development for individuals with a disability because lack of skill is viewed as detrimental to physical activity participation (Bouffard, Watkinson, Thompson, Dunn, & Romanow, 1996). However, while improving movement competence is a laudable goal, the role of personal choice, freedom, and initiative in activity may have been overlooked. Lewko (1978) stated that "The goal of having handicapped children demonstrate desire to participate in sport-recreation activities on their own accord ... should be a major socialization goal" (p. 273). More recently, Sands and Doll (1996) aptly pointed out that "an unintended consequence of ... individualization is that many students come to believe that the conditions controlling their ability to learn are managed by adults, and that they cannot direct or affect their own success" (p. 59). Thus if participating voluntarily in physical activity is important, skill alone will not be sufficient. In addition to skill, individuals with a disability need to feel in control of their lives, free to choose recreation activities, and aware of their strengths and weaknesses. The current term that captures this spirit is self-determination. Recreation specialists have written about these issues for some time (e.g. Dattilo & Rusch, 1985; Bullock & Mahon, 1992).

A broad conceptualization influencing special education has emerged from Wehmeyer and colleagues (Wehmeyer, 1992, 1998; Wehmeyer, Agran, & Hughes, 1998). In this context, self-determination refers to a dispositional characteristic of individuals. Formally, it is acting as the primary causal agent in life and making choices and decisions regarding quality of life free from undue external influence or interference (Wehmeyer, 1992). More simply put, self-determination means "people ... controlling their lives and destinies" (Wehmeyer, 1998, p. 8).

Self-determination is inferred from functional characteristics of the behavior. Wehmeyer and associates posit four essential characteristics of self-determined behavior: (a) the person acts autonomously, (b) behaviors are self-regulated, (c) the person acts in a psychologically empowered manner, and (d) the person acts in
a self-realizing manner. Each of the four essential characteristics is hypothesized to consist of component elements, the building blocks to self-determined behavior. More detailed description of the model and implications for adapted physical activity can be found elsewhere (Reid & Hermo, 1998; Reid, 1999).

Future instruction and research should promote self-determination in adapted physical activity. Individuals need to learn how to make choices and decisions, solve problems, take risks, understand elements of safety, self-observe, self-instruct, set goals, be a leader, be positive regarding expected outcomes, feel that they are in control, and appreciate strengths and weakness. Arguably, those who possess some degree of self-determination are more likely to engage in physical activity on a regular basis. In terms of research, self-determination will require considerable rethinking. For example, in studies of self-regulated learning, the experimenter cannot control the learning process. Thus, Bouffard and colleagues (e.g., Bouffard & Dunn, 1993) have allowed learners to invoke personal strategies in learning a movement sequence presented via videotape. They have reported considerable variability of strategies within and across participants and over time. As the 21st century unfolds, adapted physical activity will pay considerable attention to self-determination.

Inclusion

The notion of people with disabilities learning, working, and playing alongside their peers without disabilities is decades old. It has been debated frequently and volumes have been written, albeit often position papers, descriptions, and testimonies rather than databased investigations. As recently as 1994, both JOHPER and Palaestra published extensive commentary of current thinking and strategies to promote integration in physical activity. In addition, books (e.g. Block, 1994) and national initiatives in Canada (Active Living Alliance for Canadians with a Disability, 1994) and Australia (Downs, 1995) provide additional support to physical activity specialists engaged in integration. Estimates suggest that 93% of children in the U.S. are placed in regular schools (Sherrill, 1994). Thus, despite lacking a research base, the vast majority of children are, in fact, in regular schools, and many teaching strategies have been offered.

Inclusion is more than placement of students with a disability in regular education or physical education. Rather, inclusion refers to the process of including all students within community schools and classes with age-peers while at the same time providing appropriate education with necessary supports. Moreover, it is an attitude that everyone belongs. Inclusion means that students are admitted to regular physical education when they begin their education, rather than having to meet some criteria for admission, as occurs with mainstreaming and least restricted environment perspectives. Future debate and discussion within education will focus on process, support, changes required in regular physical education, and whether all children can and should be included (e.g. DePauw & Doll-Tepper, 2000). These debates will not deal with whether inclusion of the vast majority of children with disabilities is desirable. In addition, the future will see research playing a greater role in assessing curricular and instructional adaptations (Block & Vogler, 1994).

Some applied research in adapted physical activity explores the efficacy of inclusion strategies. For example, Houston-Wilson, Dunn, van der Mars, and
McCubbin (1997) instructed six 9–11-year-old peer tutors in techniques of prompting, feedback, and task analysis. Their data demonstrated that the peer training enhanced motor performance of children with developmental disabilities compared to no training. Bernabe and Block (1994) investigated the effect of modifying rules of a regular softball league to facilitate inclusion of a girl with severe disabilities. The study was conducted in a community-based recreation program. The effects of the modifications were determined by comparing performance scores of the girl with her teammates. For example, while her batting average and on-base percentage were in the lower half, she was not the lowest in either. Also, providing assistance to her was not time consuming, since there was no difference in time per inning when she played compared to days that she missed. Finally, Kalyvas (2000) studied the impact of sport adaptations, comparing a volleyball lead-up game to an adapted version of the same game. He assessed the extent to which the adaptations allowed students with and without disabilities to participate successfully yet remain challenged and interested. Overall, the adaptations enhanced the participation of both students with and without disabilities. All younger children perceived both games as interesting and enjoyable, while some of the older male children did not enjoy the adapted game, preferring the challenge of the nonadapted game.

These three studies of inclusion are particularly applied in nature and attempt to provide data on the effectiveness of commonly suggested inclusion strategies: peer teaching (Houston-Wilson et al., 1997), activity adaptations in community sport (Barnabe & Block, 1994), and physical education settings (Kalyvas, 2000). Other investigations have explored inclusion from the perspective of the child with a disability (Goodwin & Watkinson, 2000). Collectively, they begin to provide a database for what Sherrill (1998) refers to as adaptation theory.

Summary and Conclusion

The link between research and practice can be elusive, particularly in education settings (Davis & Burton, 1991; Reid, 1993; Stein, 1983). Adapted physical activity specialists in higher education are well positioned to function as research brokers between research and practice. Quality applied research the potential of contributing to relevant theory (Reid, 1989) and critical practice. The present paper has suggested ways to enhance the adapted physical activity enterprise by (a) engaging in ethical philosophical discussion; (b) using physical activity as a dependent measure more frequently; (c) attending to diverse and changing populations, particularly older persons with disabilities; (d) debating research assumptions and philosophies; (e) addressing nomothetic and idiographic research perspectives; (f) clarifying the impact of clusters and comorbidity in research; (g) remembering that self-determination should be a central focus of research and practice; and (h) providing a database for strategies of inclusion in physical activity.

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